

SAND OVER POORLY STRUCTURED CLAY

General Description: *Medium thickness loose sand, usually with a thin bleached subsurface layer, sharply overlying a coarsely columnar structured red clay, calcareous with depth*

Landform: Gently undulating rises.

Substrate: Massive sandy clays, clayey sands and sandstones of Tertiary age.

Vegetation:



Type Site: Site No.: MO058

1:50,000 sheet:	6727-4 (Monarto)	Hundred:	Monarto
Annual rainfall:	375 mm	Sampling date:	09/03/06
Landform:	Upper slope of gentle rise, 2% slope		
Surface:	Loose with no stones		

Soil Description:

Depth (cm)	Description
0-13	Dark brown loose light loamy sand, compact and light red in colour from 9 cm. Sharp to:
13-38	Red very hard medium clay with moderate very coarse columnar structure. Abrupt to:
38-60	Red, light yellowish brown and strong brown hard massive very highly calcareous medium clay with 20-50% fine carbonate segregations. Diffuse to:
60-105	Light grey, red and yellow hard massive very highly calcareous sandy light clay with 20-50% fine carbonate segregations. Clear to:
105-110	Sandstone (iron and silica cemented clayey sand).



Classification: Hypercalcic, Mesonatric, Red Sodosol; medium, non-gravelly, sandy / clayey, deep

Summary of Properties

- Drainage:** Moderately well drained. The poorly structured subsoil clay perches water causing saturation of the topsoil and upper subsoil for up to a week following heavy or prolonged rainfall.
- Fertility:** Inherent fertility is low, as indicated by the exchangeable cation data. The low clay content surface has limited capacity to retain and supply nutrients. Sulphur and copper are deficient according to the test results, although there are ample reserves of subsoil sulphur.
- pH:** Slightly acidic at the surface, strongly alkaline with depth.
- Rooting depth:** 60 cm in sampling pit, but few roots below 38 cm.
- Barriers to root growth:**
- Physical:** The coarsely structured dispersive subsoil affects root distribution patterns, causing most roots to follow the surfaces of the aggregates, rather than penetrate. As a result, water use efficiency is poor.
 - Chemical:** High pH and sodicity below 38 cm restrict deeper root growth.
- Water holding capacity:** Approximately 50 mm in potential rootzone of annual plants.
- Seedling emergence:** Water repellence is the only likely factor to affect emergence.
- Workability:** Loose to soft surface soil is easy to work over a range of moisture conditions.
- Erosion Potential**
- Water:** Moderately low due to gentle slope, although soil is inherently highly erodible.
 - Wind:** Moderate, due to sandy surface.

Laboratory Data

Depth cm	pH H ₂ O	pH CaCl ₂	CO ₃ %	EC 1:5 dS/m	ECe dS/m	Org.C %	Avail. P mg/kg	Avail. K mg/kg	SO ₄ -S mg/kg	Boron mg/kg	Trace Elements mg/kg (EDTA)				Sum cations cmol (+)/kg	Exchangeable Cations cmol(+)/kg				Est ESP
											Cu	Fe	Mn	Zn		Ca	Mg	Na	K	
0-13	6.6	5.6	0	0.09	0.49	0.87	37	180	2.9	0.5	0.44	83	18.3	5.46	4.8	3.08	1.04	0.25	0.43	5.2
13-38	8.4	7.2	0	0.25	2.85	0.45	4	275	17	2.8	0.74	67	8.35	0.98	20.8	6.12	9.65	4.26	0.76	20.5
38-60	9.5	8.5	13	0.81	6.49	0.29	1	229	136	6.0	0.90	21	2.08	0.62	29.9	10.5	10.8	8.07	0.6	27.0
60-105	9.7	8.5	16	0.83	6.59	0.21	1	184	157	4.2	0.68	18	0.00	0.70	25.7	8.85	9.26	7.1	0.51	27.6
105-110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Note:** Sum of cations, in a neutral to alkaline soil, approximates the CEC (cation exchange capacity), a measure of the soil's capacity to store and release major nutrient elements.
- ESP (exchangeable sodium percentage) is derived by dividing the estimated exchangeable sodium value by the sum of cations.